

The above amendments are not made for patentability reasons. As such, the above amendments do not invoke the restrictions on the Doctrine of Equivalents as required under *Festo corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 234 F. 3d 558 (Fed. Cir. 2000) (en banc). Consequently, the applicant should be accorded the full scope of the claims under the Doctrine of Equivalents.

### **REMARKS**

This amendment is intended as a full and complete response to the Office Action dated January 21, 2005. In the Office action, the Examiner notes that claims 1-15 are pending, of which claims 1-15 stand rejected. By this amendment, claim 5 is amended as recommended in the office action so that the terminology is consistent with that of claim 1 and claim 6 is amended to delete a parenthetical term that does not effect the scope of that claim.

In view of both the amendment presented above and the following discussion, the applicant submits that none of the claims are obvious under the provisions of 35 U.S.C. §103. The applicant believes that all of these claims are now in allowable form and reconsideration is respectfully requested.

It is to be understood that the applicant, by amending the claims, does not acquiesce to the Examiner's characterizations of the art of record or to subject matter recited in the pending claims. Further, applicant is not acquiescing to the Examiner's statements as to the applicability of the art of record to the pending claims by filing the instant responsive amendment to dependent claims 5 and 6.

**The Rejection of the Claims As Obvious Under 35 U.S.C §103(a) is Untenable and Should be Withdrawn**

The Examiner rejected claims 1-15 under 35 U.S.C. § 103 as being obvious and unpatentable over the Crossland patent (US Patent No. 5,837,130). The rejection is respectfully traversed.

The test under 35 U.S.C. § 103 is **not** whether an improvement or a use set forth in the claims by applicant would have been obvious or non-obvious; rather the test is whether the claimed invention, **considered as a whole**, would have been obvious. *Jones v. Hardy*, 110 USPQ 1021, 1024 (Fed. Cir. 1984) (emphasis added). Thus, it is impermissible to focus either on the general subject matter or “gist” of the invention, *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 230 USPQ 416, 420 (Fed. Cir. 1986) (emphasis added). Moreover, the invention **as a whole** is not restricted to the specific subject matter claimed, but also embraces its properties and the problem it solves. *In re Wright*, 6 USPQ 2d 1959, 1961 (Fed. Cir. 1988) (emphasis added).

The references must be taken in their entireties, including those portions which argue against obviousness. *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc.*, 230 U.S.P.Q. 416, 420 Fed. Cir. 1986). It is impermissible within the framework of the 35 U.S.C. § 103 to pick and choose from a reference only so much of it as will support a conclusion of obviousness to the exclusion of other parts necessary to a full appreciation of what the reference fairly suggests to one skilled in the art. *Id.* at 419.

For prior art reference to be combined to render obvious a subsequent invention under 35 U.S.C. § 103, there must be something in the prior art as a whole which suggests the desirability, and thus the obviousness, of making the combination. *Uniroyal v. Rudkin-Wiley*, 5 U.S.P.SQ.2d

1434, 1438 (Fed. Cir. 1988). The teachings of the references can be combined only if there is some suggestion or incentive in the prior art to do so. *In re Fine*, 5 U.S.P.SQ.2d 1596, 1599 (Fed. Cir. 1988). Hindsight is strictly forbidden. It is impermissible to use the claims as a framework to pick and choose among individual references to recreate the claimed invention Id. at 1600; *W.L. Gore Associates, Inc., v. Garlock, Inc.*, 220 U.S.P.Q. 303, 312 (Fed. Cir. 1983). Moreover, the mere fact that a prior art structure could be modified to produce the claimed invention would not have made the modification obvious unless the prior art suggested the desirability of the modification. *In re Fritch*, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992); *In re Gordon*, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984).

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. *In re Wilson*, 424 F.2d. 1382, 1385, 165 U.S.P.Q. 494 496 (C.C.P.A. 1970), M.P.E.P. 2143.03. Moreover, the mere fact that a prior art structure could be modified to produce the claimed invention would not have made the modification obvious unless the prior art suggested the desirability of the modification. *In re Fritch*, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992); *In re Gordon*, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984).

The focus of applicant's invention is the substantial reduction of sulfur in naphtha/gasolines in a cost effective and efficient manner. As is noted in the specification, there are numerous prior art processes and approaches for accomplishing this highly desirable environmental goal, but all require substantial capital investments in new equipment and incur significant operating expenses. The problem solved by applicant's claimed invention is a process that is ancillary to, and that can be used in combination with existing columns to produce

naphtha having a reduced sulfur content that is very low (200 ppm) or ultra low (30 ppm). It is also a feature of applicant's claimed invention that minimal olefin saturation occurs and therefore the loss in octane value is minimized. (See specification page 6, lines 11-14.)

In contrast, the focus of the Crossland disclosure appears to be treatment of a number of different side streams taken from an **atmospheric** distillation column where only the overheads from the side draw columns that contain H<sub>2</sub>S and hydrogen are returned to the **atmospheric** column. The Crossland disclosure specifically teaches that the hydrotreated/desulfurized product is removed as a **bottom stream** for disposition elsewhere. It is not, as in the applicant's process, returned to the main column. Thus, applicant set out to solve an entirely different problem, and one that was not contemplated by Crossland. As will be explained in detail below, Crossland's process and apparatus cannot be adapted for the practice of applicant's claimed invention as suggested in the office action.

A further important distinction and difference in the respective processes is that Crossland is withdrawing and returning some materials from an **atmospheric** column, while applicant's process is used in conjunction with an FCC unit (which is not operated at atmospheric pressure). Crossland's desulfurized naphtha product streams cannot be used in the applicant's process.

The process steps disclosed by Crossland cannot be viewed by one of ordinary skill in the art as suggesting the stepwise treatment of applicant's claim 1, for the very important reason that Crossland teaches away from applicant's step of returning the desulfurized naphtha to the main column. The Examiner's attention is respectfully directed to Crossland's FIG. 1 and to the corresponding description of the treatment of naphtha stream 102 that begins at column 6, line 23 of the '130 patent. The naphtha stream 102 is passed to a distillation column reactor 30 for

treatment with a hydrodesulfurization catalyst in structure 99. Hydrogen is introduced via line 201 and the “treated naphtha” (corresponding generally to the low-sulfur content naphtha of applicant’s step(d) in claim 1), is withdrawn as bottoms stream 110. The only materials returned to the **atmospheric** column 109 are “gaseous products such as unreacted hydrogen and H<sub>2</sub>S.

Missing from the above description of Crossland’s process depicted schematically in FIG. 1, are the key limitations of applicant’s independent claim 1, step (e) of “separating and withdrawing a low-sulfur content naphtha fraction C<sub>5</sub> to 430°F boiling range from the side column; step (f) of returning the low sulfur content naphtha to the fractionation column; and step (g) of recovering the low sulfur content naphtha from an **overhead** stream withdrawn from the fractionation column. Furthermore, these missing steps could not possibly be practiced, since Crossland’s low-sulfur naphtha stream 110 had been withdrawn and diverted for other (unstated) purposes away from the column.

In Crossland’s FIG. 2, a process for upgrading effluent from a FFCU uses a distillation column reactor as the first column from the FCC reactor. The heavy fluid cracked naphtha product is withdrawn from the primary column near the top. The desulfurized product is again withdrawn from the bottoms of the secondary distillation column reactors.

Applicant respectfully submits that the Examiner has not set forth a proper *prima facie* case for rejecting the claims under 35 USC §103 of the patent law. In independent Claim 1, applicant sets forth an admittedly novel process. The process of the claim utilizes a typical fractionation column, referred to as the main column, and withdraws specified fractions as a side draw to desulfurize it in a distillation column reactor. The process utilizes distillation in the recovery of these FCC products to treat by desulfurization these sulfur-bearing compounds that are specific to the FCC naphtha in the side column. The preferred embodiment of the claimed

process withdraws a heavier stream containing up to 500° F material along with the olefinic naphtha and further fractionates the 430° F to 500° F to improve the separation of the 430° F and +430° F materials. From this additional fractionation below the catalyst beds the naphtha product from the side draw of the catalytic distillation column will not be contaminated by the entrainment of higher-boiling sulfur compounds that were not desulfurized at the operating conditions in the catalyst beds in the side column. The bottom “tails” of heavier sulfur compounds are returned to the main fractionation column, at an appropriate position where they are recovered, rather than allowing them to remain with the naphtha product.

It is this improved and patentably distinct method of catalytic distillation at specific operating conditions and the additional fractionation that permits the recovery of olefinic naphtha product from the side column with as low as 30 ppm of sulfur.

We note that the Examiner has admittedly provided no prior art reference, or combination of references, that specifically disclose the features not found in Crossland of:

1. a feed to the side column that is an effluent from an FCC reactor;
2. the treatment of the claimed fractions;
3. returning the fractions to the main reactor; and
4. adding more than one hydrogen stream to the side column.

We respectfully submit that the unsupported assertion of obviousness of modifying Crossland to include all four of the above steps can only be based on impermissible hindsight. As such, this ground of rejection should be withdrawn.

Applicant submits that claim 1 is not obvious and fully satisfies the requirements under 35 U.S.C. § 103 and is patentable. Furthermore, claims 2-15 depend, either directly or indirectly, from independent claim 1 and recite additional patentably distinct features. As such, and for at

least the same reasons discussed above, the Applicant submits that these dependent claims also fully satisfy the requirements under 35 U.S.C. § 103 and are therefore patentable. Applicant respectfully requests reconsideration and that the rejection be withdrawn.

### **Extension of Time**

Applicant is submitting with this Amendment a Request for a three-month extension of time and a check for payment of the fee. Should any additional fees be found due, the office is authorized to charge this firm's Deposit Account No. 01-0035.

### **Conclusion**

Applicant submits that claims 1-15 are in condition for allowance. Accordingly, both reconsideration of this application and its allowance are earnestly solicited.

Should the Examiner find that there are any unresolved issues as to any of the claims now pending in the application, it is requested that the Examiner telephone the undersigned at (212) 885-9250 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

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